

What is claimed is:

1. An electrode comprising:

a current collector containing at least one from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), iron (Fe), and chromium (Cr);

an active material layer containing at least one from the group consisting of simple substances and compounds of silicon (Si) or germanium (Ge) provided on the current collector; and

a thin film layer containing at least one of copper and nickel provided on the active material layer.

2. An electrode comprising:

a current collector containing a metal element which does not form an intermetallic compound with lithium (Li);

an active material layer containing at least one from the group consisting of simple substances and compounds of silicon (Si) or germanium (Ge) provided on the current collector; and

a thin film layer containing at least one of metal elements and metalloid elements which can make a solid solution with lithium and do not form an intermetallic compound with lithium provided on the active material layer.

3. An electrode according to claim 2, wherein the current collector contains a metal element which does not form an intermetallic compound with lithium, and is alloyed with at least one from the group consisting of

simple substances and compounds of silicon or germanium.

4. An electrode according to claim 2, wherein the thin film layer contains at least one of metal elements and metalloid elements which can make a solid solution with lithium and do not form an intermetallic compound with lithium, and are alloyed with at least one from the group consisting of simple substances and compounds of silicon or germanium.

5. An electrode according to claim 2, wherein the current collector is alloyed with the active material layer at least on part of the interface thereof.

6. An electrode according to claim 2, wherein the active material layer is alloyed with the thin film layer at least on part of the interface thereof.

7. An electrode according to claim 2, wherein the active material layer is formed by at least one method of from the group consisting of vapor-phase deposition method, liquid-phase deposition method, and sintering method.

8. An electrode according to claim 2, wherein the thin film layer is formed by at least one method of from the group consisting of vapor-phase deposition method, liquid-phase deposition method, and sintering method.

9. An electrode according to claim 2, wherein the current collector contains at least one from the group consisting of copper (Cu), nickel (Ni),

titanium (Ti), iron (Fe), and chromium (Cr).

10. An electrode according to claim 2, wherein the thin film layer contains at least one of copper (Cu) and nickel (Ni).

11. An electrode according to claim 2, wherein a thickness of the thin film layer is from 50 nm to 1,000 nm.

12. A battery comprising:

a cathode;

an anode; and

an electrolyte,

wherein the anode comprises:

a current collector containing at least one from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), iron (Fe), and chromium (Cr);

an active material layer containing at least one from the group consisting of simple substances and compounds of silicon (Si) or germanium (Ge) provided on the current collector; and

a thin film layer containing at least one of copper and nickel provided on the active material layer.

13. A battery comprising:

a cathode;

an anode; and

an electrolyte,

wherein the anode comprises:

a current collector containing a metal element which does not form an intermetallic compound with lithium (Li);

an active material layer containing at least one from the group consisting of simple substances and compounds of silicon (Si) or germanium (Ge) provided on the current collector; and

a thin film layer containing at least one of metal elements and metalloid elements which can make a solid solution with lithium and do not form an intermetallic compound with lithium provided on the active material layer.

14. A battery according to claim 13, wherein the current collector contains a metal element which does not form an intermetallic compound with lithium, and is alloyed with at least one from the group consisting of simple substances and compounds of silicon or germanium.

15. A battery according to claim 13, wherein the thin film layer contains at least one of metal elements and metalloid elements which can make a solid solution with lithium and do not form an intermetallic compound with lithium, and are alloyed with at least one from the group consisting of simple substances and compounds of silicon or germanium.

16. A battery according to claim 13, wherein the current collector is

alloyed with the active material layer at least on part of the interface thereof.

17. A battery according to claim 13, wherein the active material layer is alloyed with the thin film layer at least on part of the interface thereof.

18. A battery according to claim 13, wherein the active material layer is formed by at least one method from the group consisting of vapor-phase deposition method, liquid-phase deposition method, and sintering method.

19. A battery according to claim 13, wherein the thin film layer is formed by at least one method from the group consisting of vapor-phase deposition method, liquid-phase deposition method, and sintering method.

20. A battery according to claim 13, wherein the current collector contains at least one from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), iron (Fe), and chromium (Cr).

21. A battery according to claim 13, wherein the thin film layer contains at least one of copper (Cu) and nickel (Ni).

22. A battery according to claim 13, wherein a thickness of the thin film layer is from 50 nm to 1,000 nm.

23. A battery according to claim 13, wherein the electrolyte contains a

holding body, a solvent, and an electrolyte salt.

24. A battery according to claim 13, wherein film exterior members housing the cathode, the anode, and the electrolyte is further provided.

25. A battery according to claim 13, wherein the cathode contains a lithium-containing metal complex oxide.